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# The Topologies and Topographies of Hydro-Social Territorialization in Jordan.

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## ABSTRACT

Most major stakeholders in Jordan are of the view that irrigated agriculture in the highlands is not sustainable. What is less well known is how the highland agriculture is intertwined with the nature of the Jordanian state and its territorializing impulses. We argue that Jordanian state's placation of the elites by condoning their illegal water extraction and use practices, is an enterprise in hydro-social territorialization in a topographical register. But territory is not just topography, and the vast assemblages of human and non-human actors, e.g., international donors, markets, urban water users, along with water and energy infrastructure, also spawn a topological territory, where networks of power bridge the gaps between here and there, and make distant relationships, beyond the presumed sovereign boundaries, urgently present in local waterscapes. The topological register of Jordanian territorialisation through water, is quite resentfully experienced and noted by the smaller Jordanian farmers. The regional geopolitics and state's territorial impulses intersect with water and land use practices to produce the deeply fissured politics of, and through water in Jordan.

**Key Words:** Groundwater; territorialisation; topography; topology; highland agriculture; assemblage.

## INTRODUCTION

Land is power and struggles over land, power struggles. But land cannot be created (Elden 2010: 806). However, land, as a productive resource and something worth fighting over, can be created—through water. While the techniques of surveying and cartographic representation may be paramount in the symbolic production of land in a territorial register (e.g., Schnell and Leuenberger 2014), it is water, especially in the arid realm, that is the key material building block of land with a strategic, political, economic and military valence—or territory (Elden 2010, Swyngedouw 2004). Highland agriculture and concomitant water development in Jordan, has been the *bête noir* of international donor agencies, and some Jordanian water managers contemporaneously (Bonn 2013). The unsustainable groundwater pumping involved, and the trade-offs with supplying water to burgeoning urban populations of Jordan have put the question of water development in the highlands of Jordan, at the centre of water policy debates in the country (Hagan 2008, Humpal *et al.* 2012). We argue that highland water development, initially by the Jordanian state, and subsequently by private small and large agricultural interests, is an instance of hydro-social territorialization by the Jordanian state (also see Rodriguez-de-Francisco and Boelens 2016, Boelens *et al.* 2016, Hoogesteger *et al.* 2016). But this territorialization is riven by internal contradictions across spatial scales, between long term sustainability, neo-liberal development, geopolitics of water and urban proletarian versus rural elite placation within the Jordanian polity. We draw upon the results of a series of interviews [with the help of translators] and observations conducted with small and large farmers (twenty two in all), as well as water managers in Jordan (eleven main interviews and multiple joint meetings), to trace the contours of the hydro-social territory and territorialization, in supposedly one of the most geopolitically sensitive, and water scarce, countries in the world.

The term hydro-social points to human and hence political mediations in hydrological processes. It calls for a move away from a strictly biophysical understanding of the hydrological cycle and instead historicises the very formulation of the physical model (Linton 2008). The approach puts a premium upon discourse, culture, politics and the socially inflected materiality of water as arbiters of water geographies. Jordan is an artificial post-colonial state in a region of artificial post-colonial states. The imperatives of territorializing, within colonially drawn international boundaries are quite pressing for the country. We argue that water development for mostly commercial farming in the highlands of Jordan, was an important part of a territorializing drive by the Jordanian state. Water as an instrument of territorializing *Badia*, the arid highlands in the eastern part of the country, mirrored the neighbouring Israeli efforts at doing the same in the Negev desert (Morag 2001, Harris and Alatout 2010) and over the rest of Israel (Yiftachel 2002, Mustafa *et al.* 2016). The project, however ran into the political reality of water demand by a largely urbanized population and the physical limitations of groundwater availability in the highlands, on the one hand, and the state's now entrenched commitment to neo-liberal development, and elite-placation as a mode of ensuring legitimacy, on the other. How Jordan negotiates the conflicting spatial demands and scalar politics of hydro-social territorialization is our key question. But before we turn to that, we undertake a brief literature review around concepts, which inform our analysis, namely the hydrosocial cycle, territorialization, scale and Jordanian state formation.

#### FROM TECHNO-NATURES TO HYDRO-TERRITORIALIZATION

Water resources geography has charted a number of new directions since its early pragmatist concern with expanding the practical range of choice in water management to democratic and scientifically informed decision making, and conflict resolution (White 1968, 1973, Wescoat 1991). Starting in the 1990s, in a context of post-cold war neo-liberal triumphalism, the privatization of municipal water supply systems became the focus of Marxist and political ecology-inspired critical literatures (e.g., see Swyngedouw 1997, Bakker 2005, Mustafa and Reeder 2008). Swyngedouw (1999, 2007), however, considered agricultural water, in the context of twentieth century Spanish water landscapes or 'waterscapes'. This work analysed the production of techno-natures during early twentieth century modernization and then negotiated the later scalar politics of national integration and Spain's geopolitical alignment (with the anti-communist Western alliance) during the cold war. Swyngedouw's reflections on techno-nature combined insights from Actor Network Theory (ANT) (Latour 1992, 2005) and Marxist and socio-nature inspired political ecology (Castree and Braun 2001). His work resonated with local level analyses of differential access to groundwater (e.g. see Birkenholtz 2009a & b, Sultana 2013) and urban water supply (e.g. Loftus 2007). Swyngedouw used the concept of 'waterscapes' to apprehend the interactions between water, power and socio-political dynamics and, building from this, we develop the term for the Jordanian context (Menga and Swyngedouw 2018). However, others espousing a purer political economic analyses have focused on social power relations (in a more clearly structuralist tradition) to investigate differential access to water, again mostly at the regional and local scale irrigation systems, (e.g., see Mustafa 2002, Budds 2004). In both the theoretically hybrid techno-nature focused literature and social power oriented analyses, the question of scale remains live, understood

to be produced and reproduced through international development discourses, geopolitics, national policies and local practices.

Without rehearsing the scalar debates, of which there are plenty (e.g., Marston *et al.* 2005, Collinge 2006), we maintain that scale is not an ontological given, but is instead produced through socio-spatial practices, discursive constructs and power struggles over meanings and material configurations that are perpetually emergent from the same. The concept of the hydro-social cycle radically destabilized the orthodoxy of the hydrological cycle; it is also an enterprise in understanding how cross-scalar socio-spatial processes materially refract and transform the simple global scale hydrological cycle to the extent that it has little meaning outside a hydrology text book (Linton 2010, Linton and Budds 2014). The hydro-social, insofar as it refers to the imbrication of the social in the physical hydrological is predicated upon traversing the modernist social/nature divide; beyond that, it opens avenues for exploring the universe of the social as it interpellates and animates the hydrological. Nation building, and its concomitant territorializations, is one such social practice and discourse that is deeply relevant to the story of water in Jordan. It is to the territorial aspect of that story that we turn.

Elden (2010a: 810) discusses territory as a political technology. As a mode of socio-spatial organisation it is geographically and historically limited (to a Western modernity) and is distinct from the universal imperatives of animal biology or human social life associated with territoriality. Elden's (2010a) territory is understood in political economic and strategic registers—respectively land and terrain—but is associated, moreover, with technical development/advances (e.g. of scientific topography) and the operation of law. This recognition diverts attention from abstract and nomothetic approaches, perhaps along the lines of the 'containers' discussed by Peter Taylor (1994), to emphasise territory's configurations in the local and the material, as the product of relational networks rather than an outcome in absolute, Euclidean space (e.g. Harvey 2006: 135). And if we disregard territory as simply a thing, then Joe Painter (2010) considers territory as a 'phenomenon', to recognise a 'territory-effect' as the product of networked socio-technical practices. Therefore territory, is empirically not only a topographical object or a bounded thing-in-space: it has important topological dimensions (Allen 2016). As such, these dimensions are added to the strategic property relations, the technical and jurisdictional capacities that Elden (2010a) has identified. Furthermore, we note that it is often only *through water* that an associated mode of governmentality may be made to inhere for (dry) land.

On this view territory is topographical only to the extent that analysis removes it from geographical and historical contexts. Like Elden (2010b; 2011), we are critical of views which posit territory as *only* bounded and therefore *only* topographical (e.g. Allen 2011) and so our account of hydro-territorialization in Jordan proceeds on the basis that the reproduction of state territory is a process to implicate a range of actors and processes extending well beyond the Jordanian state's geobody. Territory, we feel, may *appear* in bounded forms, but this a mutable manifestation of strategic, political-economic, legal and technical relations, and an outcome of historically and geographically contingent dynamics. As the latter develop and modulate, we suggest, so may the hegemonic form of state territory/territorialization. We support this contention empirically by suggesting that two contradictory forms of territorialisation are apparent in the case of Jordan where, in

addition, affective relations are also drawn into overlapping, contradictory territorial processes. Here, we follow Boelens et al. (2016: 3) whose recognition of a phenomenological dimension suggests that the production of territory cannot rest in the formal processes of statehood or development but, rather, extends across scales to the biospheric inscription of human life worlds and affective experiences.

Dimensions of territory relevant to water in Jordan may now be identified. Not least among them is the territory-effect of the socio-technical practices which surround water's socially-inflected materiality, and which identify territory as *it happens* in Jordanian waterscapes. Socio-technical activity implies organisational 'disposition' and accompanies the activities and politics of infrastructure spaces where the interests of 'constellations of international, intergovernmental, and nongovernmental players' (Easterling 2016: 15, 21) collide and domestic and transnational jurisdictions overlap. The state's institutional authority, then, is met with competing sources of power and territorialising agency. We therefore recognise the waterscape's territorial relations in terms of interconnectedness exceed simply the cartographic or strategic calculations of terrain, or the property rights of land associated with the state (Elden 2010a). Certainly, these are important, but the networked, topological relations produced between and among thirsty people and crops, their deep-water wells, water tankers, suction pumps, boreholes and standpipes (Mustafa and Talazi 2018) are not simply commensurable with the formation of land and terrain, but bound directly to the historic, ongoing and cross-scalar production of Jordanian territory.

Indeed, state power and irrigation systems (for example) have existed in dialectical relation (Wittfogel 1957), *each becoming* as power is territorialised and reterritorialized at different scales over time. Equally, within quotidian territorial imaginations water plays an important role as a pivot, mediating and reproducing the state's territorial power. And although water governance is usually vested at the national/state level, the accumulation and circulation of capital reproduces space to the detriment of existing scales of governance, whether national or local (Rodríguez-de-Francisco and Boelens 2016: 143, Harris and Alatout 2010). In other words, water and the technologies of its consumption/circulation order disposition(s) of authority within the Jordanian waterscape as it is continually reconfigured. We can therefore follow Jeffrey (2013) to understand the state as a form of continual improvisation by multiple actors. As Jason Dittmer (2014: 393) recognises, they 'huddle around [an] attractor in topological space', where an 'assemblage', whether a state-territorial formation or a waterscape, or indeed their intersection, is actualized in place and time. In this sense our attention turns to the topological relations produced among water infrastructures, by movements of commercial goods, and by people's spatial experiences, and so by no means is our discussion of Jordan's hydro-territorialisation limited to the topographical.

Although recent discussions have turned to 'hydrosocial territories' we can only consider the latter as a topographical container if viewed in the narrowest sense. Recent literatures on the 'hydrosocial cycle' (Linton and Budds 2014) have reinterpreted water-society relations in terms of dialectical interrelationships and hybridity, and here we follow a general concern for 'multiscalar [networks of] . . . humans, water flows, ecological relations, hydraulic infrastructure, financial means, legal-administrative arrangements and cultural

institutions and practices' (Boelens et al 2016: 2). In this way, to revert to Elden (2010a), hydrosocial *territory* may now be applied to dimensions of territory beyond land and terrain. Whether imagined or materialised, the territory-effects of a diffuse, hybrid hydrosocial world are pronounced: hydrosocial territory represents a technology to include/exclude, discipline and marginalise. And so, to emphasise, territory is not simply the backdrop to struggles over absolute space but social substance in itself (Baletti 2012); it is vividly revealed in human activity in its political, cultural, material and societal registers to which we add ecological interactions. Hydro-social territory underscores the impossibility of any anthropocentric separation with nature and emphasises a place for the material and ecological in the drive to produce hydrosocial worlds according to various perspectives (Boelens 2015). Fundamentally, however, our concerns are directed towards the deeply politicised power relations that spawn geographies of highland agriculture in Jordan.

With regard to Jordan specifically, Yorke (2013) as well as Hussein (2018a) document the intertwining of water management with the imperatives of a patrimonial, patronage based, shadow state. Yorke (2013) particularly traces the history of Jordanian state formation and documents how the Hashemite monarchy managed to retain its centralized power by making water and land, amongst other resources, central to the state's patronage of powerful tribal and commercial interests, to buy their loyalties. Keulertz (2013) further analyses the shadow state's forays into land acquisition in Sudan to secure strategic food security, and virtual water imports into the country. Mustafa *et al.* (2016) argue that even with donor driven reforms like water user associations (WUAs) in the Jordan valley, elite takeover is more the norm than exception. Despite their failure to become genuine forums for participatory water management, WUAs in Jordan valley are nevertheless preferred by small farmers as a conduit for access to the state and patronage networks. A main insight from the literature on Jordan is that water management is not just politicised but, rather, is one of the main currencies of the country's politics (Yorke 2013).

We will argue that the impulse for patronage-based water management and allocation in Jordan has driven a topographical territorialisation of the Jordanian state. But, subsequently in a neo-liberal era characterised by the increasing political power of urban centres like Amman, contradictions have emerged: elite-centred water allocations in the rural highlands are increasingly difficult to reconcile with the water demands of a growing urban proletariat. The interrelated elite-proletarian water demands reveal a spatial relation between cities and highlands and within the highlands, but *also* suggest that Jordan's territorialisation now proceeds in a topological register, beyond the body of the state itself, characterised by flows of migrants to the cities and the export commodities leaving the highlands' commercial farms. To analyse Jordan's contemporary state territorialisation in terms of topography, we feel, is to prioritise a spatial hermeneutic which occludes the reterritorializing impulses of globalization and regional market integration. The story we tell here is of the irresolvable tension between these two territorializing impulses. As Allen (2011: 291) reminds us:

In a topological 'take' on the reworking of state spatialities, what comes to the fore is less the extension of power 'upwards', 'downwards' or 'sideways' and rather more of an interplay between all the different institutional interests and authorities involved

where agendas are mediated for specific political ends through a mix of distanced and proximate actors.

The topological conceptualization therefore incorporates actors such as international donors, agri-business and the Jordanian security state whose power-laden negotiations deeply destabilize topographical spatial geometries (Allen 2011). Not coincidentally, such spatial instability also maps onto the fluid materiality of water and its flows across Jordanian waterscapes. Our argument also leads to consideration of a fluid topological reterritorialization of the Jordanian waterscape through cross-scalar processes that are circumscribed when analysis is limited by its focus on the topography of the Jordanian state.

The research presented in this manuscript is based upon 14 interviews conducted with high-ranking officials, policy makers and consultants in Amman. In addition 21 detailed interviews were conducted in the field with large, medium and small farmers in the northern governorates, Azraq Oasis, and in the Zarqa river basin. The interviews lasted from 30 minutes to 2 hours and were supplemented with visits of the agricultural farms and detailed field observations. The primary research was supplemented with extensive review of the prolific grey literature on the water sector in Jordan, along with the more limited refereed published literature. The narrative offered below interprets qualitative interview data to illustrate the contours of power relations as they are actuated in the topological spaces of hydro-territorialization in Jordan.

#### MODERNIST VISIONS AND ELITE PLACATION IN HIGHLAND AGRICULTURE

In Jordan rain fed agriculture has been practiced since pre-history. A form of agro-pastoralism has characterised agriculture within a narrow belt placed on a north-south axis penetrated by the winter Mediterranean precipitation. Further east lie the Syrian desert (in the north) and the northern edge of the Arabian desert (in the south of the country). This highland region (*Badia*) constitutes 85% of the land area of Jordan (Figure 1). The British colonial authorities had formed the vassal Emirate of Transjordan under the rule of Abdullah, of the Hashemite clan. British military and financial patronage of the ruling family continued after independence in 1946: they continued to provide financial resources for the relatively poor state to buy off the loyalties of the local tribal leaders, to establish the legitimacy of the Hashemites and to ensure political stability. In 1948 and again in 1967 occurred massive influxes of Palestinian refugees which led to the near doubling of Jordan's population. In the late 1960s the Palestine Liberation Organization (PLO) came virtually to be a parallel state within Jordan. In the aftermath of the civil war of 1970, with thousands of casualties, the PLO was expelled and something of a truce was called between the Jordanian population of Palestinian descent, from the West Bank of the Jordan River, and the local population from the East Bank of the river. Today, the Palestinian-Jordanian population dominates the economy and the commercial sector of the country while the East Bank Jordanian population dominates the state sector and security establishment (Yorke 2013).



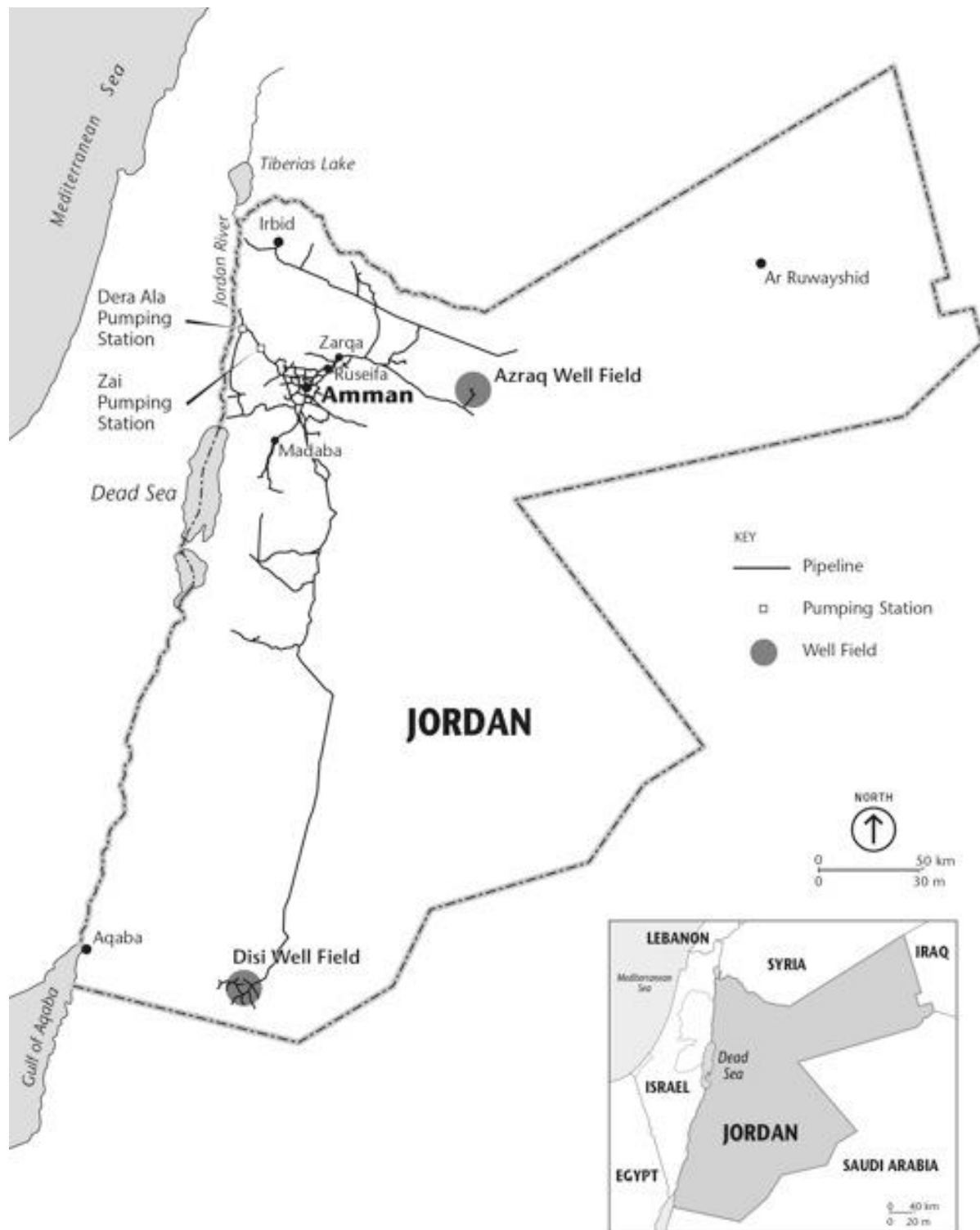


Figure 1: Main water related pipelines and infrastructure in Jordan.

The story of water, agriculture and state formation must be understood in light of the historical-geographical, geopolitical and resultant demographic forces that the country was subjected to from its inception. Additional influxes of refugees from Iraq and Syria (since 2003 and 2010 respectively) has driven up Jordan's population by an additional 14% (Ghazal 2016). These demographic shocks driven by regional geopolitics are compounded by the fact that most of its territory is a semi-arid steppe region, underlain by an aquifer which is

steadily being depleted because of rampant groundwater pumping; in part of the Badia groundwater is going down by almost a metre annually (Humpal *et al.* 2012). In the frequent estimation of Jordanian water managers and policy makers, the demographic shocks following from instability in Jordan's neighbourhood represent the key impediment to rational water management. This has reproduced their focus on water supply enhancement strategies:

But a key constraint is political instability in the region and how it impacts us. We simply cannot plan in the context of high political uncertainty in the region, because of population spurts we get from refugee populations, e.g., in 1948 and then in 1967, when we got another 320,000 Palestinian refugees. We got refugees from the civil war in Lebanon, 750,000 Iraqis from the Gulf—many of whom have returned but still many are still here, and then finally the Syrian crises has increased our population by 10%. How can you possibly do any long range planning in this context? (A senior water policy expert, 18/11/2013).

Within this context, the earlier Jordanian state's efforts at settling down the Bedouin population and awarding them free land and water rights represented an attempt at state territorialisation within a classic agrarian register. This was confirmed by many of our interviewees at the policy level and, in fact, in some instances the interviewees deemed government support for agriculture as one of the core functions of state for ensuring food security:

This country does have an idealized view of agriculture where they, imitating the Israelis, wanted to settle down the nomadic population to build a nation (An expatriate water expert, 17/11/2013).

Ninety percent of the practicing farmers are the ones who settled down from being Bedouin, but they also run their farms to sustain their animals (Members of the Jordan Olive Products Exports Association (JOPEA), 17/07/2016).

Food security is a major concern for us. Just as the American subsidize their farmers we have to subsidize ours . . . Yes, domestic water supply is non-negotiable, but agriculture and food security is also important. Most importantly we want to preserve a pattern of living [agricultural] and cannot destroy it overnight (A high ranking Ministry of Water and Irrigation official 14/11/2013).

These quotes speak of a topographic state imaginary. We return to this point directly, but first it is worth noting that they also suggest Jordanian territory's dimensions as a political technology. As *land*, property relations are established through occupation; agricultural practices are among those which tied the state directly to its intended territorial extent (Elden 2010a: 805). Jordan had to be permanently occupied by the sons of the soil, to reproduce it as Jordanian; farming and water consumption cemented the intended political-economic or property relations. Elden (2010a: 209) identifies a number of techniques, geographically and historically contextualized, which are concomitant with the production of territory: analytic geometry, associated developments in cartography, surveying, and maritime navigation and to these we would now add, in the Jordanian context, the

techniques of highland agriculture which, in the mid-20<sup>th</sup> century, supported settled agricultural populations and the domestic water supplies upon which they relied.

Elden's (2010a: 806) etymological work identifies 'terrain' to denote lands separated from the municipal authorities or ecclesiastical estates which owned them, as perhaps agricultural colonies. Those lands became the objects of 'security, management and administration' (Elden 2010a: 806). Here, for Jordan, we recall Soja's (1989: 54-55, 166) description of agrarian regions' relation to urbanization. We do not want to exaggerate the notion of the agrarian 'colony' too far in the case of Jordan (the post-colony) but nonetheless the country's demographic transformations (amidst broader processes of uneven capitalist development) has implied an urban dependency upon the rural for food, labour, markets and above all water. Moreover, the interrelation of Jordan's cities and highlands crystallises around competing elite-proletarian (urban and rural) water demands and, as we have suggested is at the root of contradictory territorialising impulses in Jordan. Therefore, the strategic relations of terrain, which characterises the state's relationship with agricultural areas beyond the city (and the direct control of municipal authorities) would seem to be apparent in contemporary Jordan.

These remarks, we suggest, underscore the specificity and the unfolding of Jordanian territory—a Jordanian territory-process—after the mid-20<sup>th</sup> century. But we must return briefly to a topographical state imaginary. Perhaps this is most obviously evident in Jordan's international boundaries with its four neighbouring states. In this sense, law—specifically the international law of title to territory and boundaries—represents a further source of territory, particularly visible in strategic calculations (Elden 2010a: 810). National law, too, was a vital territorial source: Jordan's Central Water Authority (CWA) was established on a legal basis.<sup>1</sup> This is a powerful source of a topographical imaginary directed towards the production of a bounded territory within international borders.

Questions of 'here' and 'there', as well as of powers 'absent' and 'present', have crumpled the neat Euclidean spatial imaginaries of the state (Allen 2011). In 1951 the UN Relief and Works Agency 'established an Azraq Pilot Scheme, to investigate the possibility of developing agricultural resources for the settlement of refugees.' A well was then dug 'near Druze Village, and two refugee families were settled' but the project was abandoned in 1952. A Jordan-United States Joint Fund for Special Economic Assistance authorised investigation of land and water resources near Azraq in 1955 and the work—the Princess Alia Project—was carried out by engineers from Pennsylvania and Illinois.<sup>2</sup> This work was reviewed by the British in the Azraq Groundwater Project report on the groundwater potential of aquifers. British, American and German donors were involved in decisions over financing infrastructure (for example to convey spring water from Azraq to Irbid in 1963 and

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<sup>1</sup> Article 3 of the Law of the Central Water Authority (1960) reads: 'An Authority, called the Central Water Authority, shall be and hereby is created for the purpose of investigating, planning, establishing, promoting, implementing, constructing and to the extent necessary, managing and operating a comprehensive programme for development, conservation, protection, and control of the water resources of the Kingdom of Jordan for maximum feasible use for domestic, municipal, livestock, industrial, irrigation, hydro-electric power and other beneficial purposes.' See Department of Technical Co-operation, 'Reconnaissance in Jordan, 26 October – 6 November, 1963', in: Central Water Authority, Jordan, National Archives (hereafter NA), Kew, file FO 957/262.

<sup>2</sup> Published Report on the Azraq Groundwater Project (1965), NA, FT 10/16, 45.

then Amman in 1980) and relating to technical assistance and funding energy infrastructure to power the pumps. Apparently centralized state activity may reinforce topographical assumptions but a history of international interventions in the Jordanian waterscape has involved flows of capital, knowledge and (expert) human bodies across Jordan's international boundaries: the Jordan waterscape is a manifestation of global flows and power relations.

Nonetheless, an otherwise extremely topographic imaginary highlights a fundamental contradiction of Jordanian water management: with a sprawling and continually expanding metropolitan region (Amman and other smaller cities like Irbid, Madaba and Ajloun which are each expanding and demanding greater water shares) water can only come from groundwater reserves of the 'colonized' highlands. Presently, this is a source exploited by highland agriculture. Current water transfers from the Disi well field (in southern Jordan) and the Jordan Valley's King Abdullah Canal to Amman are enormously expensive. Long term, the only source can be a transfer from the agricultural sector (Figure 1). This contradiction—between late twentieth century attempts to make the desert bloom and the demands of a burgeoning urban population--were compounded in the 1990s by Jordan's switch from a government-centred, developmentalist economy and agricultural sector towards a more neo-liberal economic model (Parker 2009, Potter *et al.* 2009):

Making the desert bloom was our stipulated national policy through the 1970s-80s, but then the multi-national corporations (MNCs) started showing up here and made a mockery of the whole process. It is no longer about small farmers and livelihoods but about corporations, e.g., a couple of years ago some Spanish corporation showed up wanting to buy up 200,000 hectares to plant olives! (A senior water policy expert, 18/11/2013).

The classic, possibly romantic imaginary of a territorializing Jordan, spreading outwards to its boundaries through practices of settled farming has run up against images of more outward-looking economy. The latter is predicated upon the topological relations of an agricultural export economy, almost entirely dependent upon imported Egyptian and some Pakistani labour to grow high value crops (tomatoes, peaches, grapes, assorted vegetables and olives). Through this transition the Jordanian agricultural sector has been integrated into and made dependent upon markets in Europe and those, immediately adjacent, of Iraq, Saudi Arabia and Syria. This underscores a strategic relation of neoliberal territorialization: highland agriculture in Jordan has tied the production of state territory to the further production of global markets. Terrain, then, becomes relevant but not only for state actors. The historical trajectory of Jordan's territorialization has reproduced class power and a mode of production dominant under Jordan's neoliberal orientation. This has extended to the non-state agents of Jordanian territorialisation (e.g. large commercial farmers). The current closure of transit routes through Syria and Lebanon and the loss of markets like Iraq and Syria represent the major threats to commercial farmers in the highlands, as well as in the Jordan valley.

One of the biggest problem lately is the loss of major markets, e.g., the Syrian, Iraqi and Eastern European market. The only market we have is the Gulf market. But there

is competition with the Egyptian and Iranian producers (An illegal large farmer, Azraq, 21/07/2016).

Jordan's orientation towards global markets has challenged the state's historical form of territorialisation based upon an imaginary of smaller farmers, producing for food security. The turn towards export-based farming has meant large farms are those best able to sustain market competition.

Our property? You are talking 100 hectares. There is no one below 50 dunums<sup>3</sup> in our area. Majority are big farmers, because you need good capital to start, and a large area. We are the oldest farmers here and the town was settled here in the 1970s to encourage Bedouin to settle down, and we have a Bedouin background (Large farmer, Hawran Plateau, 27/06/2016).

While many large farmers, like the one above were settled by the state back in the 1970s, others are entrepreneurs who have simply appropriated the land and water in the highlands to initiate farming (Hussein 2018a). Since 1992 it has been declared illegal to undertake any further drilling in the highlands, but all the same, by some estimates thousands of new wells have been drilled, which paradoxically are also on the somewhat legally illegal spectrum (Humpal *et al.* 2012). Regardless, territory (land) is predicated on occupation by whatever means and territorialisation has proceeded in tandem with the development of agricultural technique:

There is no real land settlement in our project area. It is a simple case of land grabbing in the region, where people just fence off land, drill illegal water pumps and start operating. Nobody can touch them, as in the example of this one farmer who was challenged by the water authority for his illegal pumping and he got permission from the King himself to keep doing what he had been doing. At the moment, there are about 600 wells in our project area [Mafrq] out of which only 10 or so are legal and the rest are illegal. You see it is legally not allowed since 1992 to drill wells for agricultural purposes, but thousands have been dug since, and then subsequently legalized. So those wells are illegally-legal—don't ask me how (An expatriate water expert 17/11/2013).

The urgency of the water crises, especially for urban water supply, where the threat of political unrest is a lot more urgent (by virtue of concentrated populations in physical proximity to the seat of government) than in the rural areas, cannot be over stressed. In that context, it is a remarkable act of political tightrope walking for the Jordanian state to simultaneously placate the large commercial farming elites, while risking the wrath of the urban proletariat in the long run. The urban elites do quite well with access to water at the expense of the poorer urbanites (Mustafa and Talozzi 2018). This is even more surprising, when one considers that so rich and powerful are many of these farmers that agriculture is generally a very small part of their financial portfolio:

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<sup>3</sup> 1 hectare = 10 dunums

Agriculture is less than 10% of my income portfolio. But in our case, you need something to be connected to the land itself. It wasn't my choice, the land is not for me, it is for my entire family. It is definitely an identity issue (Large farmer, Mafraq, 27/06/2016).

In Jordan, part of the culture is also to have your own farm. To own a farm is not an investment for money [necessarily], but to complete your circle of prestige. For example, this doctor friend of ours, after retiring from his practice he bought 500 dunums, but he planted only 200 dunums. He has a good house there with a swimming pool, and a BBQ on the side. He invites us and his friends to his farm to enjoy it and have fun (Members of the JOPEA, 17/07/2016).

Seemingly, issues of prestige, identity, and links to the land drive many of the Jordanian elites to farming, at a cost of considerable social capital on their part, to fend off the state's attempts at regulating or limiting them. Perhaps a historical imaginary of dispossession, on part of many farmers of Palestinian origins as well as the state's own neurosis about land, territory and nationhood are not irrelevant to this seemingly economically and biophysically irrational behaviour. Moreover, we also recognise the production of territory (land), as it is tied to particular cliques within state agencies. During our interviews with a military personnel association a retired Brigadier said:

In the Jordanian military, only the *mukhabarat* (military intelligence) is allowed to *undertake farming as an economic enterprise*. They run our farms in Baqura. They also started farms in Sudan, but that didn't go very well. . . . For us Felaheen (peasant farmers) agriculture is what gives you dignity in your country, and gives you a sense that you belong to the country, that you are linked to its past and are a part of its future. It is not something that we just do for profit. It is a social heritage and it is what connects us to the country (28/07/2016).

The above quote with its multiple registers of identity, national security and even deep state involvement in the agricultural sector should convey some sense of the depth of commitment that the Jordanian state and polity has to the status quo, of large farming in the highlands. That the agricultural settlements through the 20<sup>th</sup> century were a part of a larger nation-building project and sustaining a polity built upon patronage and elite capture of the state is clear, but we suggest that this is visible specifically in regard to territory. But under neo-liberalism coupled with further demographic shocks and increasing urbanization, the nature of that territorialization is not quite captured by the topographic sense of territorialisation where sovereignty involves the performances of bounded territories (Allen 2011). Multi-national agri-business, large farmers exporting to international markets and overseas agricultural investments also point to how distanced and proximate actors simultaneously are present and absent in terms of their power and influence in the Jordanian waterscapes. The reality of this topological 'new' territorialization is not lost upon the smaller and less powerful farmers in Jordan. It is to an account of their experiences, and even charges of deterritorialization levelled at the Jordanian state due to the power of export agriculture assemblages, that we now turn.

#### OF SMALL FARMERS AND NEO-LIBERAL AGRICULTURE

The smaller farmers in the highlands, especially in the Mediterranean precipitation belt in western Badia are mindful of how their constrained access to water is an outcome of the Jordanian State's trans-local commitments. Their subjectivity informed by that realization is articulated in a couple of registers—of memorializing ecology, and of angst about reterritorialization of Jordan in a globalized register. Also, like most large farmers, some smaller farmers had also simply appropriated the land without following any legal or commercial process to gain a right to the land.

I don't pay any land rent. The owners of this land don't know if they own this land. There are farmers who lease land through the ministry of Agriculture, like in the south. But that doesn't happen here, e.g., the Al Masri family who get land allocations. Here you just either lease the land, or buy it, or put hands on it and use it. I am trying to appropriate this land and I may or may not succeed in the long run (Small farmer, Azraq, 21/07/2016).

There is a common impression in the highlands that if one develops land and maintains possession for 15 years, the land can be legally transferred. Evidently, this impression is based upon legal statutes in Jordan, e.g. Law 17, 1974—and we recall again the indispensability of the law to territory—but none allow for regularization of outright appropriation (Humpal *et al.* 2012). Among small farmers though, such outright appropriation is relatively uncommon. Nevertheless, the large farmers did appropriate the land outright for agriculture and installed some expensive irrigation infrastructure, indicating an intent to stay and defy the state. Even in the 1960s for example, exploratory reports specifically called for reserving the aquifer under Azraq as a reserve for municipal supply with agriculture strictly regulated.

'Aside from a few desert watering points, should they be required, drilling should be restricted to municipal supply wells constructed by the government. 'In Area II, all drilling should also be controlled. Small areas may be irrigated from wells, to produce alfalfa or other crops that are relatively salt-tolerant and do not require a high level of land practice. The Wadi Herth and Wadi Medeisisat areas are particularly recommended.'

The reality today is quite different from what was envisioned then.<sup>4</sup>

The ecological register was particularly prominent at the Azraq Oasis, which used to be a Ramsar convention wetland site. Water on the surface of this wetland had not been observed at the time of our visit since 1994. A heavy downpour in mid-April 2017, however, led to the filling up of the 73km<sup>2</sup> Azraq Wetland Reserve site, after 23 years (Ramsar 2017). Since 1980 the oasis has been aggressively tapped for water for Amman. This was also the time when vegetable farming began in this region. The following extended interview quote from a native Druze resident of the Azraq town, outlines the changes he had experienced and knew about.

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<sup>4</sup> Azraq Groundwater Project report, NA, FT 10/16, 41.

In the past it was a desert with birds flying from the Northern hemisphere on their way to Africa. Water was abundant, the lake was large. There was a lot of grassland for horses and cows and Buffaloes. I was about 15 years old in the 50s. There were a lot of wild animals, e.g., deer. We used to hunt ducks, fowls, deer. The lake provided us our livelihoods. Every household used to have cows. We used to take the cows to the lakeside to graze and bring them back at night. In the 50s there was no agriculture. In the 50s there was no way to irrigate. Azraq was established as a trade centre where Bedouins would market their products. Druze came here in 1918 from Jebel Arab. South east of Azraq groundwater was 2 meters deep and it was saline. We would dig out the water and put them in mud evaporation ponds, during the day. In the evening the air would become cold and make crystals from the salt.

Fruits and vegetables only arrived here in the 1960s. Before then anybody who went to Zarqa brought back fruits and vegetables if they could afford it. The economy here was on salts and water and wildlife were abundant. In the 1930s people started living out of the castle [that they lived in before] and started building their own houses. The first piped network was in 1964 to provide drinking water. Water was delivered from one water fountain per neighbourhood, and the women would collect water, from there.

They first took water from Azraq for Irbid in the 1960s. And that was when the water declined for the first time. They did it till the mid-1970s. After that they started pumping to Amman. By the early 1980s and the people started selling their cows because there was not water and no grazing (Druze Farmer, Azraq, 21/07/2016).

Indeed, in 1962 the Central Water Authority directed the construction of the Azraq-Irbid Pipeline scheme, the pumps and storage tanks it required. 'A portion of the old Iraq Petroleum Co. pipeline was reclaimed, and partially re-laid, three high lift pumps were installed at Druze Village, taking water from the North Pool of the springs.'<sup>5</sup> The Druze farmer's somewhat nostalgic rendition of a time gone by, and the amenities of a wetland the native populations enjoyed, was also resonant with the loss of those in the process of change, instigated by far away metropolises of Irbid and Amman. But along with the partial domestic integration through the apparatus of pumping stations and pipes that transferred water from the wetlands to the cities, were also undertones of geopolitical changes in the region that also affected the Azraq Oasis, e.g., the mass migration of Palestinians into Jordan after the 1967 war, and their appropriation of land in the highlands. The historic and ongoing tensions with Israel and the ambivalent positionality of the Druze population of Azraq within that conflict, also featured in the conversations e.g.,

In 1968 the farms started to appear. Al Ausha was full of grasslands. In the 1970s investors especially Palestinians came and started establishing farms. The land was cheap, it was 5JD per Dunum. I sold a 41 dunum plot for 20 JD.

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<sup>5</sup> Azraq Groundwater Project report, NA, FT 10/16, 37.



The government looked favourably at agriculture, because it was improving the economy of the region. We even got a salt factory in 1986. They established a cooperative association of the salt and the price of salt increased by 3 times.

In the 70s and 80s the people started to worry about water because it started disappearing. So, the government came and in the early 80s they said that you need to move from here because you don't have a sewerage system and you are living on top of an aquifer. But that never happened. When Israel decided to take in all the Druze people, the govt. of Jordan decided to cancel its plan of making them move and instead drew a line beyond which we could not live (Druze farmer, Azraq, 21/07/2016).

Unlike the large farmers, many of the small farmers had been farmers—agro-pastoralists—for generations. Their view of the globalized export-led agricultural development in the highlands was jaundiced by their perceptions of their own marginalization in the process and their suspicions of the colonial West. For pastoralists particularly, the very notion that a historically pastoral society like highland communities should be undercut by international meat imports seemed incomprehensible and offensive, e.g., as per a pastoralist:

We will stop in 5 years because it is expensive to raise cattle and the price is not good enough. Olive trees are the biggest threat. The government is spreading out olive trees everywhere where there used to be pastures for the cattle. So now we don't have pasture for our cattle. The British gave them the idea to do that, and now it will be over for us soon. They all depend on imported meat in this country and it tastes awful (Pastoralist, Ramtha, 17/06/2016).

Whether the British gave the farmers ideas about planting olives is beside the (present) point. It is well known that olive plantation is one of the main ways of improving agricultural land values (Humpal *et al.* 2012). However, the perception of marginalization—and viewing that marginalization through the lens of Jordan's colonial history and its continued relevance to their lives—is significant as it cuts against the state's envisioned territorialisation through agricultural practice.

Indeed, to the interviewee farmers, the history of colonialism and its linkages to their present predicament was an ever-present theme.

Farming is the original profession of most of the people here. Our fathers and grandfathers used to practice it. Previously we used to grow barley and wheat but in the last 40 years olive tree came to the area with British and American support. But this is a political ploy on part of the British, because it makes the country dependent upon America and Britain for the wheat.

I own 25 dunum and all my brothers work in farming and the other two brothers have 25 dunum. Each works by himself. I have cows and cattle and my brother has Doves. I also have bananas here. Only olive is the plant we crop. We stopped wheat and barley for 20 years. The govt. brought us olive and gave us money to plant. Most

of agriculture is rain fed. Every week we buy water. 10-12 cubic meters, for the cows, the cattle and the house needs (Olive farmer near Ramtha, 17/06/2016).

It would be beyond the scope of this article for us to argue that olives have produced a neo-colonial wheat dependency in Jordan. But certainly, the British Legation in Amman was discussing imports of U.S. wheat in the early 1950s and so we *can* say that calculations of terrain may work against state independence<sup>6</sup>. But, whatever the case, highland olive plantations are among the greatest drivers of uneconomical/wasteful water practices (Humpal *et al.* 2012) and they continue apace, partially driven by market signals and the subsidies on water.

But these practices are also not entirely divorced from the Jordanian state's territorialization-through-agriculture impulse which, we feel, may be illuminated through assemblage-based interpretations of geopolitics. Dittmer (2014: 385-386), for example, imagines a posthuman geopolitics incorporating nature and animals among other 'objects', emphasising their interactions. Here, scalar tensions—between fields, cities, states and global systems—become less meaningful, blurring the macro and micro in geopolitics. Equally, Dittmer (2014: 393) can emphasise possibility spaces, conjoined with affective relations, in more abstract topologies. In this paper we have been concerned with the materiality of urban and water infrastructure but affective dimensions may be fed in to our assemblage. Here, territorialisation proceeds in and through the intersections of the biological, material and environmental, not to mention the suspicion and hostility of farmers and their perceptions of their own marginalization.

In this paper we have discussed an assemblage produced by linkages between the water infrastructure, the marketing channels for olives, fruits and vegetables and the domestic and international flows of agricultural products such as wheat and meat. Affectively, smaller Jordanian farmers are deeply suspicious of the state and its apparent subservience to Western geopolitical and commercial interests. The state's territorialisation in the topological register as per Allen (2011) may be to recast the Jordanian state as an integrated entity within the global flows of capital.

But such topological-style insights are not followed through or exploited for what they tell us about how the political demands of 'distant powers' are established at a distance through a mix of distanciated and proximate actions. Sovereignty may require the performance of clearly bounded territories, but that does not mean that such territories enclose all the political relationships which produce them or simply extend themselves to bridge the gap between 'here and there' (p. 247).

The smaller farmers and pastoralists imaginary and practices are deeply hostile to what they perceive to be deterritorialization and then reterritorialization in a globalization mode. They do bridge the gap between 'here and there' in their understanding and experience of highland agriculture in Jordan. The specific place based ecological memories or livelihood, and agricultural practices based upon planting wheat and barley and animal husbandry,

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<sup>6</sup> Interest in the railway alignment for a road to Aqaba; prospects of arrival of American wheat via Beirut; no contribution from British defence funds for development of the road from Ma'an to Amman, NA, FO 371/98878 (1952).

hearken to a different mode of localised territorialisation. In this localized notion of territory, it is a container of memory, ecology and livelihood, that is the basis for dignity and productive contribution to national life.

## CONCLUSION

In this paper we have suggested the relevance of water to a Jordanian territory-process beginning in the second half of the twentieth century. The production of property and strategic relations, the operation of international and domestic law, and the advancement of techniques (specifically in agriculture and irrigation) have produced territory in a vein consonant with Elden's (esp. 2010a) work. Our discussion involves the interpretation of territory as a phenomenon and the state as the continual improvisations of a series of actors besides centralised authorities invested in the waterscape. However, territory is not only topography and, as opposed to sovereign or biopolitical perspectives (Alatout 2006), our account has emphasised the networked, topological operation of power.

An assemblage, like the Jordan waterscape, is produced through the relational ontologies and topological spatialisations which pull together its biospheric, material, environmental and social components. The waterscape unfolds through its topological space drawing in international donors, flows of capital, state and legal practice, and Jordan's various rural and urban populations. The waterscape's social relations are embedded in crops, infrastructure, developmental ambitions and in no small measure within the cultural identity markers invested in land and agriculture. Recognizing the pipes, wells, marketing networks (etc.) underlying the Jordanian waterscape as not simply coincidental formations of e.g. infrastructure but *as assemblage* helps us understand the relationality and spatiality of a hegemonic form of cross-scalar politics. This is an outcome contingent upon the interests of private capital, international donor funding, and state and deep-state power to which the fortunes of local water managers are inevitably and unfortunately shackled.

Jordanian water managers have hitched their fate to the Dead Sea-Red Sea Conveyor, which will bring desalinated water to Jordan (Hussein 2018b, Bonn 2013). It is an enormously expensive infrastructure project, that the Jordanians have an expectation of getting financed. Paradoxically the same geopolitical imperatives that prevent Jordanian state from taking tough political decisions with regard to highland agriculture, are the ones that they suspect will induce the international donors to finance the US \$12 billion project, i.e., keeping Jordan stable, mostly for Israel's benefit (see Hussein 2017).<sup>7</sup> Therefore, the urgency of reform highlighted by international donors is simply not shared by the Jordanians, just as Jordan's project of hydro-social territorialisation is not understood, or engaged with by the international donors.

The variegated territorially inflected story we tell of Jordan's waterscapes should be instructive for any initiatives at water sector reforms in Jordan. Jordanian water managers more than any Western hydrologists, agronomists or policy experts are mindful of the rational choices that they are faced with in highland agriculture. One hydro-economic model

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<sup>7</sup> Regional geopolitics was urgently and eerily present in conversations with interviews. Many interviews in the Mafraq/Ramtha region in northern Jordan were frequently interrupted by the earth-shaking sounds of aerial bombing just across the border in Syria.

after another has highlighted for them the need for stricter regulation of groundwater pumping in the highlands. But few international water experts are willing to engage with the political imperatives and constraints that drive Jordanian water management, or a substantial lack thereof, in the highlands. Hopefully, our argument for reading the highland irrigated agriculture as an exercise in hydro-social territorialisation highlights the need to engage with the question of water in Jordan in relation to the vexing, but equally important politics of water. The analyses and insights offered here can be a starting point for a more politicised and politic water management in one of the more water stressed countries of the world.

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